

Jesse Eaton

Computational Biologist

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<https://jaebird123.github.io/>

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EDUCATION

Carnegie Mellon University

September 2016 - December 2017

M.S. Computational Biology

GPA: 3.91

Tufts University

September 2011 - May 2015

B.S. Biomedical Engineering

Minor: Computer Science

GPA: 3.45

RESEARCH

Tumor Sample Deconvolution and Phylogenetic Inference using SVs

July 2017 - January 2018

Carnegie Mellon University in Professor Russell Schwartz's Lab

- Paper accepted for proceedings at 2018 ISMB Computational Biology conference. Publicly available here <https://academic.oup.com/bioinformatics/article/34/13/i357/5045780>
- Defined novel constraints for inferring phylogenies from bulk tumor derived structural variants (SVs)
- Enforced biologically relevant relations between structural variants and copy number variation segments
- Implemented integer linear program to deconvolve bulk tumor samples adhering to phylogenetic constraints

Phylogenetic Models for Predicting Cancer Progression

January 2017 - June 2017

Carnegie Mellon University in Professor Russell Schwartz's Lab

- Solely constructed pipeline for tumor genomic sample analysis and prediction
- Developed and implemented algorithms for extracting features from phylogenetic models of tumors
- Predicted cancer progression with increased accuracy using genomic in addition to clinical features

Detection of Circulating Tumor Cells

September 2014 - May 2015

Tufts University in Professor Irene Georgakoudi's Lab

- Investigated effect of density separation on forward and side scattering for leukocytes and breast cancer cell lines
- Analyzed differences in backscattering between breast cancer cell lines and populations of leukocytes

PAPERS

Deconvolution and phylogeny inference of SVs in tumor genomic samples

July 2018

Jesse Eaton, Jingyi Wang, Russell Schwartz

- Eaton J, Wang J, Schwartz R, et al. Deconvolution and phylogeny inference of structural variations in tumor genomic samples. *Bioinformatics* 2018; 34:i357i365
- Link to Bioinformatics: <https://academic.oup.com/bioinformatics/article/34/13/i357/5045780>

SKILLS

Programming	C, C++, Python, R, Go, Matlab / Octave, HTML, CSS, Javascript, Ruby + Rails
Computer	Git, Unix environment, API Development, MongoDB
Math and Statistics	Constrained machine learning, Regression, Linear optimization, Algorithms
Biology	Sequence alignment analysis, Cell culture, Confocal backscattering microscopy

WORK

Machine Learning Research Engineer February 2018 - Present
Qeexo Inc. (Pittsburgh, PA)

- Created machine learning pipeline and visualization tools for diverse set of input signals and projects
- Compressed machine learning models for extremely time and space constrained environments (used C language)

Graduate Researcher May 2017 - September 2017
Carnegie Mellon University in Professor Russell Schwartz's Lab (Pittsburgh, PA)

- Designed, implemented, and documented pipeline with custom algorithms to predict tumor progression
- Established theory for tumor sample deconvolution and phylogenetic inference using structural variants
- Instituted daily 15 minute meeting and use of Slack communication tool to increase lab productivity

Software Systems Engineer September 2015 - August 2016
MITRE Corporation in Open Health Services Department (Bedford, MA)

- Designed and developed web based electronic medical record validation tool
- Core engineer in fast paced collaborative development environment
- Built RESTful API service for internal and external consumption

Software Engineering Intern May 2014 - August 2014
MITRE Corporation in Operational Innovation and Transportation Department

- Utilized configuration management tool (Chef) for deployment of scalable software
- Devised alert system for configuration updates on Amazon Elastic Compute Cloud (AWS)

COURSES

Computer Science	Machine Learning, Simulation, Algorithms, Data Structures, Machine structure and assembly, Web programming
Math	Statistical inference, Modern regression, Discrete math, Calculus (I, II, III), Differential Equations
Biology	Computational Genomics, Genetics, Quantitative physiology (I, II), Drug delivery, Medical imaging, Tissue engineering, Biophotonics, Cellular biology
Engineering	Electrical systems, Biomedical engineering, Mechanical statics and dynamics, Fluid mechanics, Thermodynamics
Physics and Chemistry	Physics (I, II), Chemistry (I, II), Quantum Chemistry

EXPERIENCE

Presenter at ISMB 2018 July 2018
Chicago, IL

- Presented proceedings paper titled "Deconvolution and phylogeny inference of structural variations in tumor genomic samples"

Sub-reviewer

September 2017

Carnegie Mellon University in Professor Russell Schwartz's Lab

- Assisted with reviewing cancer biology papers for the Asia-Pacific Bioinformatics and RECOMB Conferences
- Critiqued experimental design and suggested improvements for model specifications

BIOMEDevice Conference Attendee

April 2016

MITRE Corporation in Open Health Services Department

- Documented emerging technologies for the purpose of understanding trends in medicine
- Presented findings to department and recommended new directions for department